Specific data were gathered from Sites 5LR9949, 5LR9961, and 5LR9974 in order to address the research hypotheses proposed above. Explicit historical research, mapping, field, laboratory, and report preparation methods used to collect this information are outlined below. A public education program for the Wathen Ranch (5LR9974) is described in Section 4.7.

4.1 HISTORICAL RESEARCH

Additional historical documentation on construction equipment is needed to clarify how the use of this equipment directed the pattern of landscape use. Regional repositories include the following:

- Western History Department of the Denver Public Library
- Stephen H. Hart Library at the Colorado Historical Society
- Fort Collins Public Library, Local History Collections
- Bureau of Reclamation, Eastern Colorado Area Office

Each of these institutions was visited and their records reviewed concerning the development of tools and machinery. Besides historical resources, selected trade journals such as *Pit & Quarry* were examined. Historic practices will be compared against modern techniques.

4.2 TOPOGRAPHIC MAPPING

Topographic maps of the landscape before water was added in Horsetooth Reservoir were prepared. This was accomplished by taking the 1983 HydroSurveys, Inc. map of the lake-bottom topography and enlarging it digitally using ArcView® so that greater detail can be shown. On this enhanced map was plotted all previous cultural resources surveys, known sites, and construction disturbance areas. The sites were identified and labeled as to time period.

4.3 FIELD METHODS

Field investigations were conducted at the three sites, with the principal objective of collecting additional data that can enhance our knowledge and understanding of the site and its occupants or users. The following procedures were implemented at each site: (1) additional mapping, (2) excavation of test trenches, and (3) expansion of the trenches and pits to full excavation units to encompass buried features or structural remnants. These procedures as they apply to each site are explained below.

4.3.1 Mapping

The existing sketch maps were updated and details added, if necessary. A datum was established in a location within the site boundaries that provides an unobstructed view of the entire site. In addition to surface details, all excavation units were on the map relative to the datum. Black-and-white and digital photographs were taken of the site before any excavations commenced.

4.3.2 Test Trenches

Test trenches were excavated on Sites 5LR9949 and 5LR9974 to determine the likelihood of buried features and/or structural remnants. The trenches were placed so as to intersect surface manifestations and were aligned relative to the orientation of those features. If this alignment differed significantly from True North, then location designations were prefaced with "grid" (i.e., grid north, grid east, etc.) to distinguish them from the cardinal directions. Each trench was 1 foot wide but varied in length. They were excavated in 4-inch levels until features or structural remnants were exposed, or until culturally sterile deposits were reached. The fill removed from the trenches was screened through ¼-inch mesh hardware cloth. The screen residue was thoroughly scrutinized for all cultural materials, which was collected, segregated by provenience lot (test trench and depth), and placed in appropriate containers. Each collected item was assigned a sequential Field Specimen (F.S.) number and described on a F.S. inventory sheet. This same information was marked on the outside of the container.

Two trenches were excavated at Site 5LR9949 (Figure 4-1). Trenches 1 and 2—200 ft. and 150 ft. long, respectively—were excavated through the center of the multi-room structure (Feature C) just east of the quarry rubble pile. Trench 1 was aligned with the long axis of the site, parallel with the orientation of the visible surface rooms. Because this alignment differed so much (approximately N65°E) from True North, it was designated Grid North. The contiguous stretch of the trench ended just (Grid) north of Room 7, and continued as three short (10 ft. long) segments at 150-160 ft., 170-180 ft., and 190-200 ft. (Grid) north of the beginning point. Trench 2 was oriented perpendicular to Trench 1 (i.e., Grid East-West), the two trenches intersecting in Room 2. A third trench was proposed to be excavated through the middle of the enclosed structure (Feature E), but the feature had been removed by unknown persons by the time investigations began and was therefore not excavated.

Two trenches were excavated at Site 5LR9974 (Figure 4-2). Trench 1, 200 ft. long, crosses the length of the site, through Features A and B. It is oriented N70°W, this orientation labeled Plan (or Grid) North. Trench 2, 150 ft. long, is oriented perpendicular to Trench 1 and crosses the (Grid) southern end of the site.

All trenches were photographed using black-and-white film and a digital camera. Detailed profiles were drawn of each trench to illustrate the relationship of natural strata and buried cultural manifestations, if present.

4.3.3 Excavation Units

Should a test trench encounter buried cultural features or structural remains, then it was expanded to expose at least some, if not all, of the feature or structure. Each excavation unit measured 3-ft. square and was excavated like the trenches in 4-inch levels until the feature/structure was exposed, or culturally sterile deposits were reached. Once each unit was completed, then two adjoining walls were sketched in profile and black-and-white and digital photographs taken. When a cultural feature or structure was exposed, it was drawn in plan view and photographed.

Because the trash dump at Site 5LR9961 is circular in configuration, a slightly different excavation strategy was used. After mapping, the feature was bisected and one-half of the contents removed in 4-inch levels until the bottom of the feature was reached (Figure 4-3). The

unexcavated half of the deposits was sketched and photographed in profile. Once the excavations were completed, clean fill was placed in the excavated half of the feature and over the top of the whole feature so that it could be preserved in place for future research.

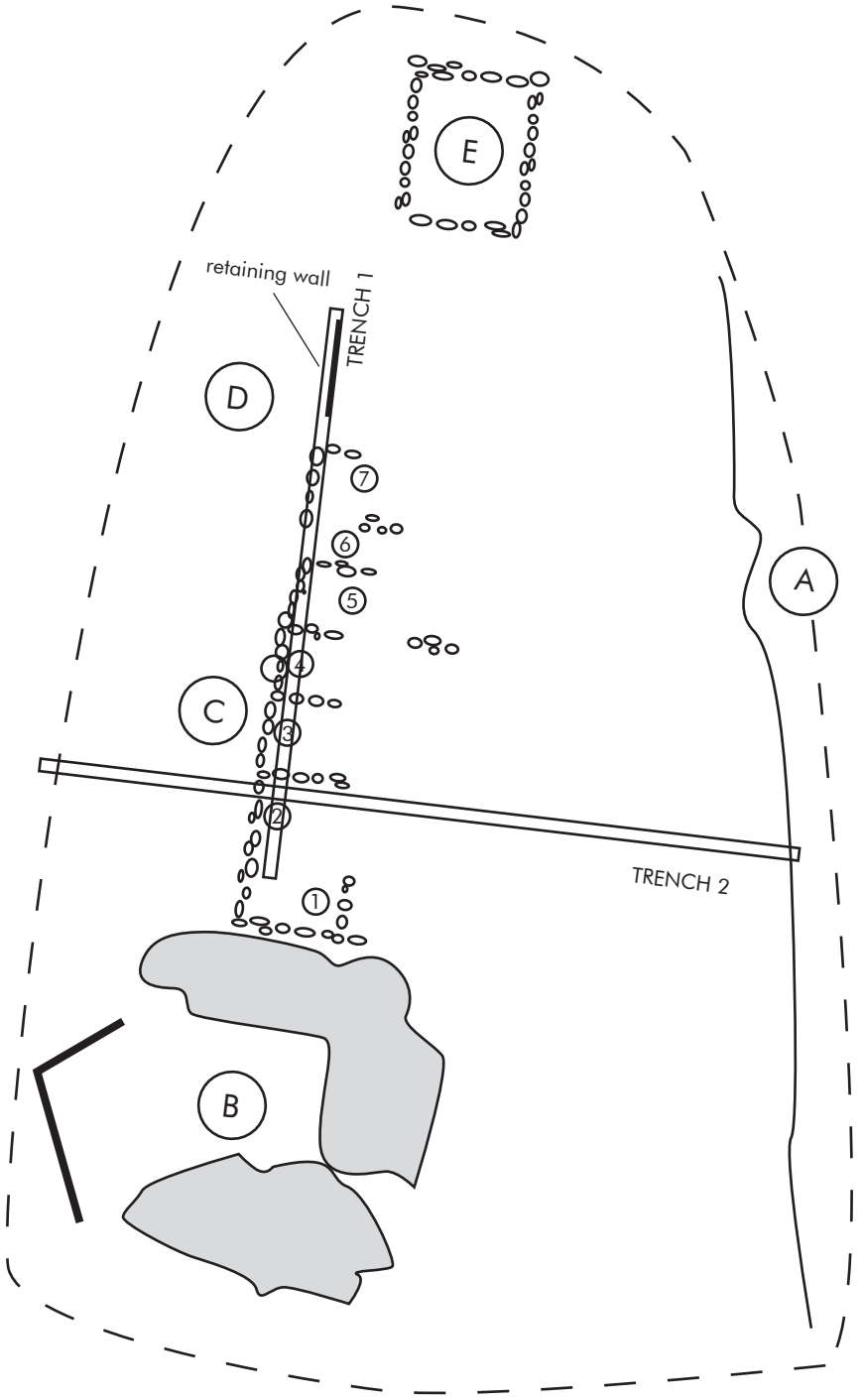
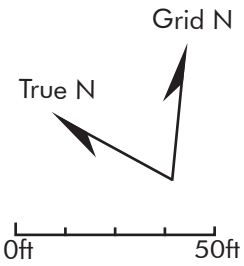


Figure 4–1.
Plan View Sketch Map of 5LR9949
Showing Locations of Test Trenches.



site boundary
test trench
quarry cuts
rubble

A-E Features
structural remains

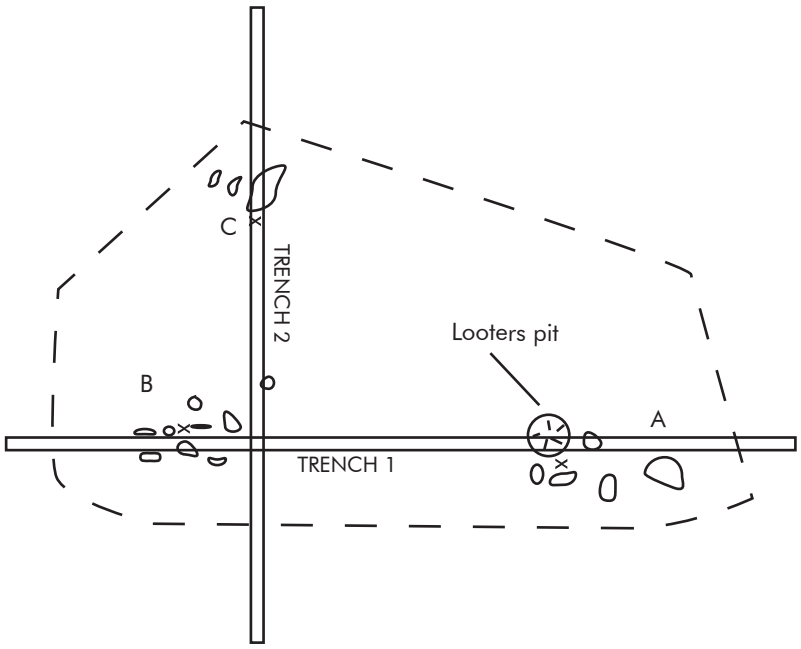


Figure 4–2.
Plan View Sketch Map of 5LR9974
Showing Locations of Test trenches.

site boundary
test trench
A-C Feature
Pipe
x Test pit

Plan North

0ft 50ft

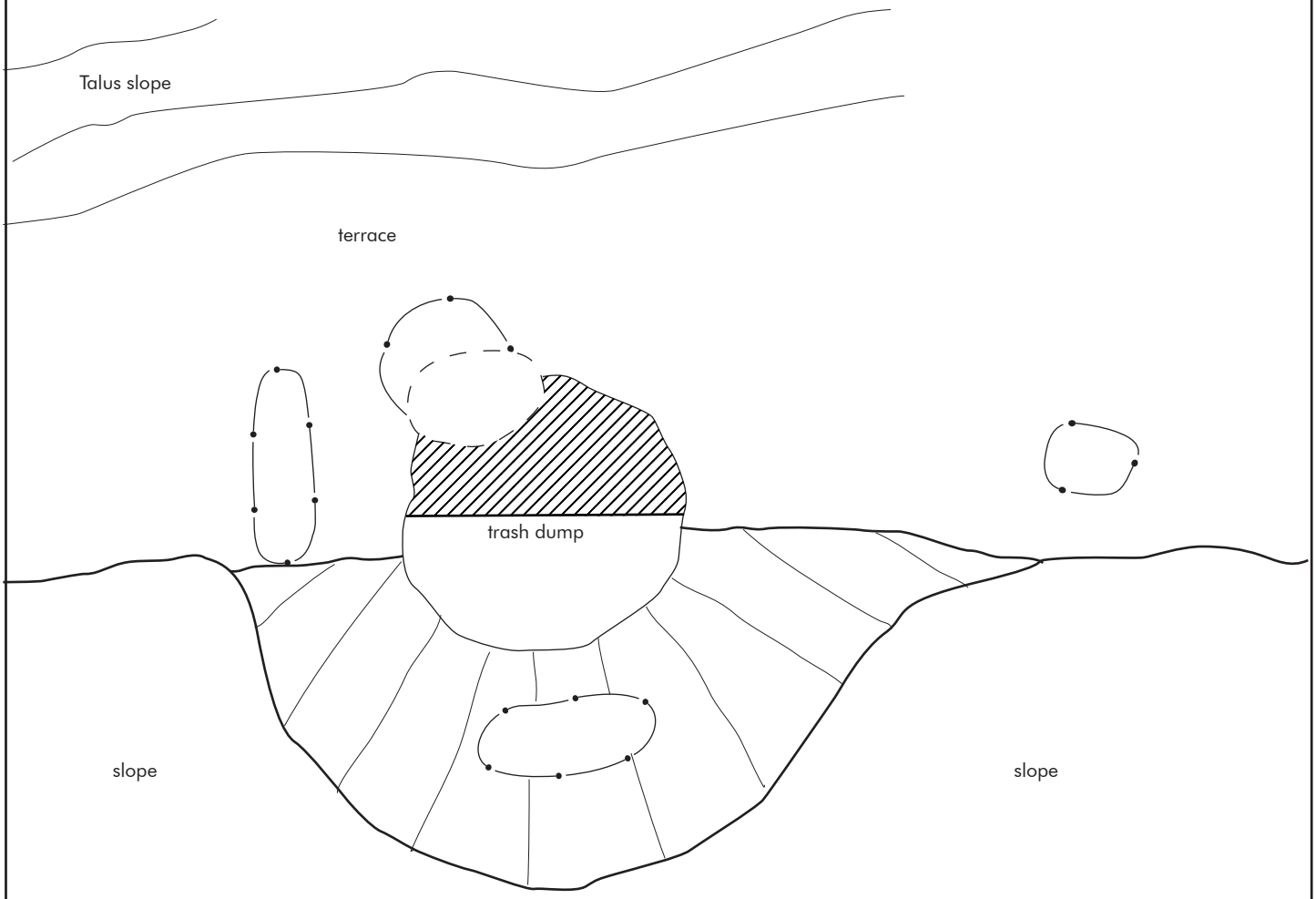
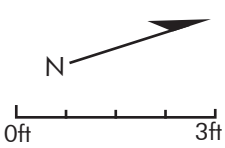


Figure 4–3.
Plan View Sketch Map of 5LR9961
Showing Location of Excavation Unit.



4.4 COLLECTION POLICY

It was anticipated that artifacts would be abundant at each, and possibly all, of the sites. In an effort to limit the number of artifacts that were collected, a policy was devised and approved by Reclamation that specified how many and what kind of artifacts would be collected. In general, a "triage" approach was used, whereby only two examples of each artifact class, if present, were collected. Singular or unusual artifacts were, of course, collected. At the conclusion of the project, all collected artifacts will be curated at the Loveland Museum. The extra artifacts were counted and then returned to the excavated trenches or units.

The classification scheme for collected artifacts is outlined below.

⌘ Nails (best preserved, whole, non-rusty, unbent)
- Nails-two samples for each class (best preserved-whole, non-rusty, unbent)
- Hand wrought nails
  - ✓ square and round head
  - ✓ different sizes
- Early machine-headed cut nails
  - ✓ different sizes
- Modern machine cut nails
  - ✓ different sizes
- Modern wire nails
  - ✓ types (flooring, finish, common, and roofing)
  - ✓ different sizes
  - ✓ Size categories (common nails):

1" = 2d	2" = 6d	3" = 10d	4 ½" = 30d
1 ¼" = 3d	2 ¼' = 7d	3 ¼" = 12d	5" = 40d
1 ½" = 4d	2 ½' = 8d	3 ½" = 16d	5 ½" = 50d
1 ¾" = 5d	2 ¾' = 9d	4" = 20d	6" = 60d

⌘ Cans (best preserved, whole, non-rusty, showing diagnostic attributes)
- Tin Cans-two samples for each class (best preserved, whole, non-rusty, showing diagnostic characteristics)
  - ✓ Hole-and-cap
  - ✓ Hole-in-cap
  - ✓ Vent hole
  - ✓ Sanitary

⌘ Wire (best preserved, non-rusty)
- Wire-two samples for each class (best preserved, non-rusty)
  - ✓ Barbed wire
  - ✓ Electrical wire
  - ✓ Tie wire

⌘ Cartridges (best preserved, whole, showing headstamps)
- Cartridge Cases-two samples for each class (best preserved, whole, showing headstamps)
  - ✓ Manufacturer
- Caliber

- Types
  - ✓ rifle
  - ✓ handgun
  - ✓ shotgun
  - ✓ black-powder

⌘ Hardware (best preserved)
- Machine parts
  - ✓ gears
  - ✓ plates
- Chain
- Handles
- Rings and loops
- Keys and locks
- Barrel hoops
- Hand tools
  - ✓ hammers
  - ✓ chisels
  - ✓ saws
  - ✓ drills

⌘ Misc. Metal
- Household items
  - ✓ appliance parts
  - ✓ silverware
  - ✓ pots
- Personal items
  - ✓ pocket knives
  - ✓ toys
  - ✓ watches
- Transportation items
  - ✓ horse/mule shoes
  - ✓ nails
  - ✓ bits
  - ✓ buckles
  - ✓ automobile parts
  - ✓ wagon parts

⌘ Apparel and Accessories (best preserved)
- Clothes
- Buckles and fasteners
- Buttons
  - ✓ material types (stone, bone, plastic, bakelite, metal, glass, horn, ivory, shell, wood, ceramic, rubber)
  - ✓ size (inches)
- Rivets
- Jewelry
- Shoes

⌘ Coinage (best preserved)
- Monetary value
- Country of origin
- Tokens

⌘ Bottle glass (best preserved, whole, color, type/function, diagnostic)
- Types
  - ✓ soda
  - ✓ hard alcohol
  - ✓ beer
  - ✓ wine/champagne
  - ✓ water
  - ✓ medicine
  - ✓ chemical
- Manufacturing types
  - ✓ free blown
  - ✓ mold blown
  - ✓ semi-auto
  - ✓ ABM
- Closure types
  - ✓ screw
  - ✓ cork
  - ✓ Hutchinson
  - ✓ lightning
  - ✓ crown cap
- Mold types
  - ✓ dip
  - ✓ hinged-shoulder
  - ✓ bottom hinge
  - ✓ 3-part
  - ✓ post bottom
  - ✓ cup bottom
- Colors
  - ✓ red
  - ✓ purple
  - ✓ green
  - ✓ blue
  - ✓ brown
  - ✓ yellow
  - ✓ pinks
  - ✓ milk white
  - ✓ black
  - ✓ clear

⌘ Window Glass (best preserved)
- Type
  - ✓ crown glass
  - ✓ cylinder

- Thickness

⌘ Other glass (best preserved)
- Beads
- Light bulb
- Figurines

⌘ Ceramics (best preserved, whole, color, type/function, diagnostic, pattern)
- Types-terra-cotta, earthenware, stoneware, improved stoneware, porcelain, ironstone
- Country of manufacture
- Company
- Vessel types
  - ✓ bowls
  - ✓ cups
  - ✓ plates
  - ✓ saucers
  - ✓ casserole dish
  - ✓ jars
  - ✓ bottles
  - ✓ pitchers
  - ✓ basins
- Pipes and smoking accessories
- Surface treatment
  - ✓ glazes
  - ✓ decorative techniques (decal, transfer, hand painted, molded relief, banded)
  - ✓ pattern types/names

⌘ Faunal Remains (best preserved)
- Animal types-mammal, reptile, bird, fish, etc.
- Species
- Elements

⌘ Floral Remains (best preserved)
- Species

Figure 4-4. Sample of Artifacts from Site 5LR9961. Clockwise from top left, Rawleigh's bottle, various bottle glass fragments, improved stoneware bowl, and quarry chisels.

4.5 LABORATORY METHODS

All collected items and field records were transported with care to the URS laboratory in Denver. There, the items were segregated by artifact type, catalogued, cleaned, and described in detail. All field records were assembled in a three-ring binder for easy reference. Sketch maps were prepared in final form. Black-and-white and color digital photographs were processed and printed. Once the artifacts had been described, they were placed in archival quality storage containers with labels and prepared for long-term storage. A second set of forms was copied on archival quality paper. All of these materials were placed in acid-free boxes and the boxes labeled appropriately. They will be stored temporarily at the Loveland Museum.

4.6 REPORT PREPARATION

Once all the analyses were completed, a report was prepared that describes the background, methods, research design, and results of the investigations. The results were interpreted within the context of the local history and prepared according to the report guidelines issued by the Colorado Historical Society, Office of Archaeology and Historic Preservation (CHS-OAHP). This report will be submitted to Reclamation and CHS-OAHP.

4.7 PUBLIC EDUCATION

The general public was invited to participate in one-day excavations at the Wathen Ranch (5LR9974) on November 9, 2002. The event was publicized in the local area and members of the public and the media were invited to attend. The participants were able to get hands-on experience in the excavation of an active archaeological project (Figure 4-5). About 30 people enjoyed participating, and Jenn Farrell and Sherri Barber from the *Fort Collins Coloradoan* covered the event in an article published on November 10, 2002. Professional archaeologists closely monitored the activities of the participants. Reclamation's Easter Colorado Area Office Public Relations Officer, Kara Lamb, assisted with organizing the event and Gary Buffington, Mark Coughlan, and Jack Naus of Larimer County Parks and Recreation provided support for the event. We thank them, as well as the following participants: Renee Shipley, Denise and Jeff Pozvek, Frank Kostal, Holly and Charles McAndrew, Sharon Austin, Monica Sweere and daughter, Lynn Haffer, Bill Bruen and mother and friend, Chris Oberhoffer, Alan Silverstein, Lori Sullivan, Carol Tenner, Carol Lamb, Tara Moberg, Beth Hodge, Bailey Barner, Anne Mutaw, and Pat, Gavin and Julian Maestas.

Figure 4-5. Public Archaeology Day at Site 5LR9974.

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